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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/651,889	08/30/2000	Ritsuko Kawasaki	0756-2205	2171

22204 7590 03/23/2005

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EXAMINER	
FARAHANI, DANA	

ART UNIT	PAPER NUMBER
2891	

DATE MAILED: 03/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

N/A

Office Action Summary	Application No.	Applicant(s)	
	09/651,889	KAWASAKI ET AL.	
	Examiner	Art Unit	
	Dana Farahani	2829	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 December 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3 and 10-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3 and 10-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

2. Claims 1, 11-16, 18, and 21-24 are rejected under 35 U.S.C. 102(e) as being anticipated by Mano et al., hereinafter Mano (US Patent 6,294,796).

Regarding claims 1 and 18, Mano discloses in figure 6e a TFT with a channel region 302a over a substrate 301; wherein a portion of the channel region is convexed shaped in a channel width direction (the direction along an axis coming out of the page, which is perpendicular to a carrier flow direction), the channel width direction being parallel to a plane (the plane that passes vertically through the substrate) of the substrate.

Regarding claims 11 and 21, a channel region 302a and source and drain regions 306 are formed in a semiconductor layer of the TFT shown in the figure, wherein a portion of the

channel forming region is convexed in a direction (this direction would be along an axis extending from top to the bottom of the figure) perpendicular to a channel length direction and parallel to a plane of the substrate. Note that Mano discloses in figures 6a and 6b, that a region in the channel is etched in a concave shape (see column 6, line 45). Therefore, the concave part is bowl shaped and is concaved in a channel length direction and convexed in a channel width direction.

Regarding claims 12 and 22, a channel forming region 302 and source and drain regions 306 formed in a semiconductor layer shown over the substrate of the figure, wherein a portion 302a of the channel region is concaved in a direction (this direction would be along an axis extending from top to the bottom of the figure) perpendicular to a channel length direction (the direction from left to right of figure 6c, which is also parallel to a carrier flow direction) and parallel to a plane of the substrate (this plane passes horizontally through the substrate).

Regarding claims 13 and 23, a channel forming region 302 and source and drain regions 306 formed in a semiconductor layer of the substrate, wherein a portion of the channel region is convexed in a channel width direction (this direction is along an axis coming out of the page, which is also perpendicular to a carrier flow direction), the channel width direction being parallel to a plane of the substrate (that is a plane coming through the substrate, out of the page).

Regarding claims 14 and 24, a channel forming region 302 and source and drain regions 306 formed in a semiconductor layer of the substrate, wherein a portion of the channel region is concaved in a channel width direction (the channel width direction could be said to be along an axis extending from top to the bottom of the figure, which is perpendicular to a carrier flow

direction), the channel width direction being parallel to a plane of the substrate (this would be a vertical plane extending through the substrate).

Regarding claim 15, a channel forming region 302 and source and drain regions 306 formed in a semiconductor layer of the substrate, wherein a portion of the channel forming region is convexed in a direction (this direction would be along an axis extending from top to the bottom of the figure) perpendicular to a carrier flow direction (this direction would be horizontal, along the channel region from left to right) parallel to a plane of the substrate (this plane would be a horizontal plane extending along the substrate).

Regarding claim 16, a channel forming region 302 and source and drain regions 306 formed in a semiconductor layer of the substrate, wherein a portion of the channel forming region is concaved in a direction (this direction would be along an axis extending from top to the bottom of the figure) perpendicular to a carrier flow direction (this direction would be horizontal, along the channel region from left to right) parallel to a plane of the substrate (this plane would be a horizontal plane extending along the substrate).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 2, 3, 19, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mano as applied to claim 1 above, and further in view of the Japanese patent [4]04152676A.

Mano substantially discloses the limitations in the claims, as discussed above with respect to claim 1, except for zero or one grain boundary in the channel forming region.

The Japanese patent discloses in the abstract that the grain boundary in the channel region of a transistor is limited to one. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to limit the grain boundary of the channel region to one or zero in order to control the device characteristics of the transistor.

5. Claims 10 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Mano, as applied to claims 1 and 16 above, and further in view of the Japanese patent 2001028338.

The Japanese patent '676 does not disclose the thin film transistor is incorporated in to electronic devices such as camera. The Japanese patent '338 discloses thin film transistor used in digital camera and personal computer (see the second paragraph below the abstract). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the thin film transistor in the devices such as cameras so those devices have electronic components with improved characteristics.

Response to Arguments

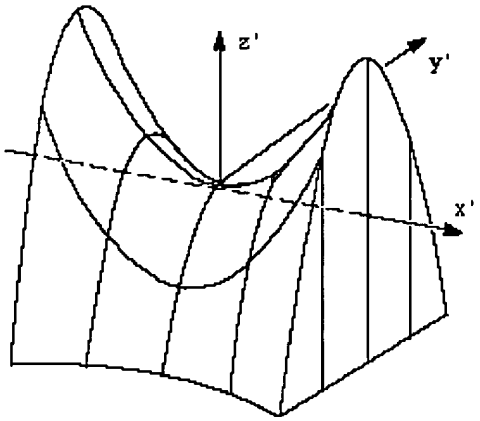
6. Applicants arguments filed on 12/28//04 have been fully considered but they are not persuasive.

Applicants argue that the Mano reference does not disclose a portion of the channel region 302a concaved shaped in the channel width direction being parallel to a plane of the substrate. However, note that Mano discloses in figures 6a and 6b, that the channel region is

etched in a concave shape (see column 6, line 45). The channel region is obviously a three dimensional object, and the concave portion is not just a single curve line in the channel region 302. Therefore, it cannot be said that the channel region in the reference is only concaved in the length direction. For illustration, the three dimensional picture of a parabola is shown below. Is it correct to say that the parabola is only concaved in length (x') direction, or only in height (z') direction? In fact, it is concaved in both x' and z' direction. At least, it can be said that the parabola is concaved in x' and z' direction; and is convexed in y' (width) and z' direction.

Similarly, the channel region in the Mano reference is convexed in the channel width direction, thereby satisfying the limitation that of the channel region is convexed or concaved in a channel width direction (claims 1-3); convexed in a direction perpendicular to a channel length direction (this direction corresponds to z' axis in the parabola example) thereby satisfying the limitation that of a portion of the channel region is convexed in a direction perpendicular to a channel length direction (claim 11-12); and convexed in a channel width direction, as stated in claim 13 (this direction corresponds to y' axis in the parabola example). Moreover, x' could be said to be the width, and similar to the channel region in the reference, the channel portion 302a is concaved in a channel width direction, which is parallel to an arbitrary plane of the substrate. Note that length is defined by Merriam-Webster's Collegiate Dictionary as an extent in space, and width is defined by the same as a horizontal measurement taken at right angles to the length. All of the curve portions (the concaved and convexed ones that extend in x' and y' direction, respectively) of the parabola qualify as a length, since they comply with the definition given above, and therefore, either y' or x' could be a width direction, according to how one chooses the length direction. Also, it could be said that the channel forming region is convexed in a direction

perpendicular to a carrier flow direction and is concaved in a direction perpendicular to a carrier flow direction (this direction corresponds to the z' direction).



Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dana Farahani whose telephone number is (571)272-1706. The examiner can normally be reached on M-F 9:00AM - 6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Baumeister can be reached on (571)272-1722. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

D. Farahani

Wael Fahmy
SPE 2814